



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:  
**28.06.2000 Bulletin 2000/26**

(51) Int Cl.7: **B66B 5/16**

(21) Application number: **99500246.6**

(22) Date of filing: **22.12.1999**

(84) Designated Contracting States:  
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU**  
**MC NL PT SE**  
 Designated Extension States:  
**AL LT LV MK RO SI**

(71) Applicant: **Dynatech, Dynamics & Technology, S. L.**  
**50015 Zaragoza (ES)**

(72) Inventor: **de Asis Mateo Mur, Francisco**  
**50015 Zaragoza (ES)**

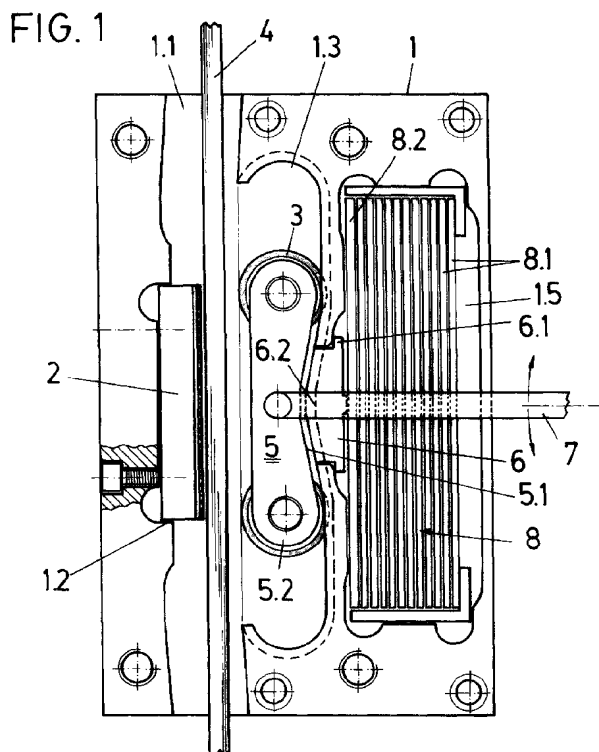
(74) Representative: **Perez Bonal, Bernardo**  
**Explanada 8**  
**28040 Madrid (ES)**

(30) Priority: **22.12.1998 ES 9802662**

(54) **Double action emergency braking system for elevators**

(57) Double action emergency braking system for elevators which performs permanent control of the motion of the elevator, in either of its directions of motion, upwards and downwards, by incorporating a parachute in each guide rail, installed in a block (1) which houses

both a knurled brake shoe (2) for progressive braking of guide rail (4) by the pressure applied by a double roller train (5) actuated by double-sloped, upwards and downwards wedge (6), the braking effort being regulated (8), which catches guide rail (4) between the brake shoe (2) and one of the rollers (3) of train (5).



## Description

### OBJECT OF THE INVENTION

[0001] The invention here disclosed consists of an emergency braking system for elevators, of double action, upwards and downwards, from among the emergency braking systems for elevators.

[0002] The invention is characterised by a permanent control of the motion of the elevator in either of its directions of operation, by means of a brake shoe and a double roller train and by an intermediate push wedge which acts on an elastic element which governs the braking effort, in addition to a block for receiving this set.

### BACKGROUND OF THE INVENTION

[0003] Emergency braking systems, known as parachutes in the industrial sector jargon, are characterised in that they prevent uncontrolled motion during downwards motion of elevators.

[0004] There also exist progressive parachutes, meant to maintain the decelerations produced within certain limits, exerting control over the braking force.

[0005] In these cases, the procedure followed is that which provides means which allow control only during downwards motion, the applicant being unaware of the existence of any progressive parachutes which allows control in both directions of motion.

### DESCRIPTION OF THE INVENTION

[0006] The invention object of the present memory relates to an emergency braking system for elevators of double action, upwards and downwards, from among the progressive type of emergency braking systems for elevators.

[0007] This invention is characterised by a permanent control of the motion of the elevator, in either of its directions of motion, upwards and downwards, by incorporating a parachute in each guide rail, installed in a block receiving both a brake shoe and a double roller train as well as an intermediate wedge which transmits the force of the roller on an elastic element, which acts as a progressive brake, as the guide rail is caught between the shoe and the corresponding roller.

[0008] To this end, the receiving block is provided with a simple cover and corresponding main end orifices for the guide rail of the elevator to pass, as well as a further orthogonal one, for the connection to the rudder to pass, so that it can be activated by a conventional external speed governor when it detects a speed over the load limit, either in the counterweight or in the cab itself, at which moment the rudder is activated.

[0009] Inserted centrally and fitted between a small internal mortising of the transverse guide rail pass orifice is provided a brake shoe, in a rectangular prism shaped part, which traps the guide rail when the latter is dis-

placed by a roller train.

[0010] The braking action is carried out by a further moving part, also internal and central with respect to the same orifice, so that its outer flat face is opposite the shoe, and with its other face presenting an internal concave finish, as well as rounded edges in a wide circular sector which may or not be housed in one of the ends opposite these circular sectors of a further internal larger mortising of the guide rail pass orifice, placed on the opposite side to the previous one.

[0011] Said flat face is surpassed on its ends by both rollers, which are concentric and with axes coinciding with those of the large circular sectors, as well as with generatrices provided by a multiplicity of pyramidal flanges.

[0012] In its resting position both rollers are distanced from the guide rail, while when they are in use they bear on it, while a special surface finish of the concave side of the braking train prevents jamming, with a lubricated material, such as a bronze.

[0013] For this purpose the brake train must previously abandon its position of opposition to the brake shoe, by action of the rudder cam towards either of the two ends of the circular mortising, which is occupied by one of the rollers, while the other one is moved forwards by the pressure received from the wedge housed in the inner concave area of the train, which exerts a normal force on the roller, supplied by an elastic element placed in the rear.

[0014] To this end the wedge is provided with flaps which act as external stops of the motion and which are placed inside a small mortising which communicates with that of the roller train on one side, and on the other side with a further larger rectangular mortising provided with a rear notch, so that in the former is housed the elastic element in contact with the wedge, while the opposite more internal mortising absorbs the bulging caused by the displacement of the wedge as it is displaced by the oblique motion of the train on the ledge of the wedge when it is moved by the rudder, so that this bulging also helps to prevent jamming during braking.

[0015] The progressive regulation of the braking in either direction of motion of the elevator is determined by the action of the elastic element placed in the rear.

### DESCRIPTION OF THE DRAWINGS

[0016] As a complement of the description being made and in order to aid a better understanding of the characteristics of the invention, the present descriptive memory is accompanied by a set of drawings where, for purposes of illustration only and in no way defining the limits of the invention, the following is shown:

[0017] Figure 1 shows the receiving block uncovered, in order to show the construction and arrangement of the brake shoe and the roller train which acts on the elevator guide rail, as well as the rudder, the wedge and the elastic elements of the invention.

[0018] Figure 2 shows schematically both alternative braking positions, which correspond to the downwards and upwards motion of the elevator.

## PREFERRED EMBODIMENT OF THE INVENTION

[0019] In view of the above, the present invention relates to an emergency braking system for elevators of double action, upwards and downwards, among emergency and progressive elevator braking systems, essentially characterised by a permanent control of the motion of the elevator in either of its directions of motion, upwards and downwards, by means of corresponding parachutes provided in each guide rail, constructed in a block (1) which incorporates a brake shoe (2) with a knurled front, for progressive braking of guide rail (4) by pressure of a double roller train (5) actuated by a wedge (6), with the braking effort controlled by elastic elements (8) by trapping guide rail (4) between the brake shoe (2) and one roller (3) of train (5).

[0020] Block (1) is provided with a cover and corresponding orifices (1.1) on the end for allowing passage of guide rail (4), as well as having a mortising (1.2) in which is placed shoe (2), with rudder (7) for driving train (5) arranged projecting out of block (1).

[0021] In its central resting position, train (5) receives in its inner concave finish (5.1) the outer end (6.2) of wedge (6), and is also provided with rounded edges (5.2) coaxial to protruding rollers (3) which are provided with a number of pyramidal flanges, housing in its braking position any of said rollers (3) in any of the rounded edges of a further lateral mortising (1.3) of orifice (1.1), depending on whether the elevator motion is upwards or, respectively, downwards, while bearing on guide rail (4) is the other roller (3), pushed forwards by the pressure of wedge (6), bored and with double inclination, upwards and downwards, which is provided with stop flaps (6.1) on a flange of the opening of a third mortising (1.4) which houses the set of elastic elements (8), in contact with wedge (6), and in turn internally extending this mortising (1.4) in order to absorb the bulging of the elastic element (8).

[0022] The number of elastic elements can vary and is adjusted on site depending on the weight of the elevator, all internal elements (8.1) made with identical thickness in order to simplify elasticity calculations for the set, changing only the thickness of the elastic element housed in the outermost end (8.2), which corresponds to the final adjustment.

[0023] This description is not extended further in the understanding that any expert in the field would have enough information to understand the scope of the invention and the advantages derived therefrom, as well as to reproduce it.

[0024] It is understood that, as long as the essence of the invention is not affected, any variations in materials, shape, size and arrangement of the elements may vary with in the same characterisation.

[0025] The terms used in the description and the meaning of the same must always be considered in a nonlimiting manner.

## Claims

1. Emergency braking system for elevators, with double action, upwards and downwards, among progressive and emergency elevator braking systems, essentially characterised by a permanent control of the motion of the elevator, in either of its directions of motion, upwards and downwards, by corresponding parachutes provided in each guide rail, installed in a block (1) which incorporates a knurled brake shoe (2) for progressive braking of guide rail (4) by pressure of a double roller train (5) actuated by a wedge (6) with two inclinations, upwards and downwards, with the braking effort controlled by elastic elements (8) which trap guide rail (4) between brake shoe (2) and one of rollers (3) of train (5).
2. Emergency braking system for elevators, as in previous claim, characterised in that block (1) is provided with a cover and corresponding end orifices (1.1) to allow guide rail (4) to pass, as well as having a mortising (1.2) which houses brake shoe (2), with rudder (7) which drives train (5) placed protruding from block (1).
3. Emergency braking system for elevators, as in previous claims, characterised in that in its resting position train (5) receives in its inner concave finish (5.1) the outer bored end (6.2) of wedge (6), and is also provided with rounded edges (5.2) coaxial to protruding rollers (3) provided with a number of pyramidal flanges, in its braking position housing any of said rollers (3) in any of the rounded edges of a further lateral mortising (1.3) of orifice (1.1), depending on whether the elevator motion is upwards or downwards respectively, while guide rail (4) bears on the other roller (3), moved forward by the pressure of bored wedge (6), with two inclinations, upwards and downwards, which is provided with flaps (6.1) acting as stops in a flange on the mouth of a third mortising (1.4) which houses the set of elastic elements (8), in contact with wedge (6), and in turn said mortising (1.4) is extended inwards in order to absorb the bulging of elastic element (8).
4. Emergency braking system for elevators, as in previous claims, characterised in that the number of elastic elements (8.1), of equal thickness, may vary and is adjusted on site depending on the weight of the elevator, while the outermost elastic element (8.2) is that which corresponds to the final adjustment.

FIG. 1

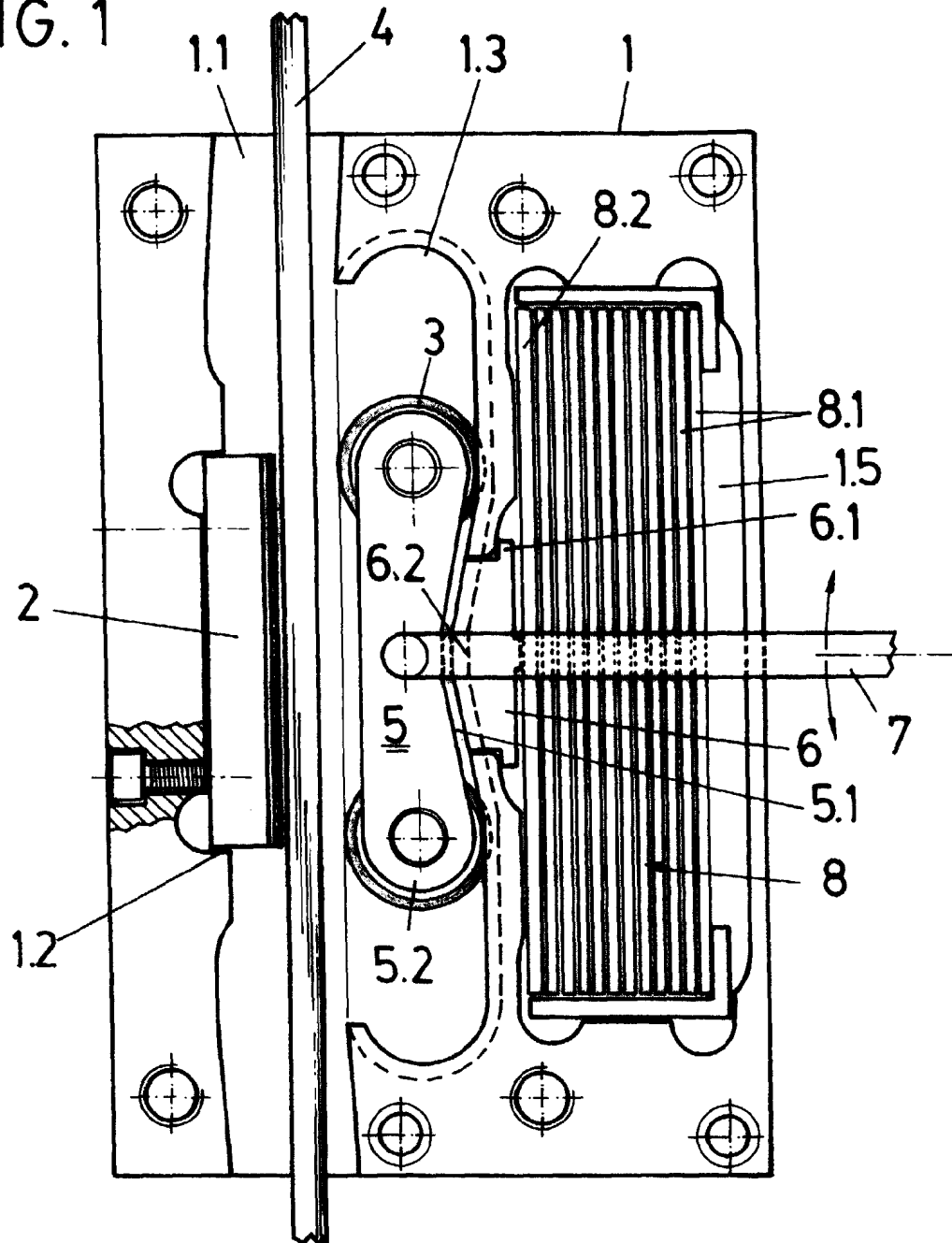


FIG. 2

